

REMARKS:

REMARKS REGARDING CLAIMS AMENDMENTS:

Original claims and claims previously presented are believed to be in condition for allowance. Entry of claim 20 is requested as allowable claim 11 written in independent format.

Claims 1 – 16 and 18 – 20 are pending in the present application.

IN RESPONSE TO THE OFFICE ACTION:

Discussion of differences between the present invention and the reference includes a table providing requirements of claims of the present invention and a summary of teachings of Stol et al. as follows:

**COMPARISON OF THE PRESENT INVENTION
WITH TEACHINGS OF THE REFERENCE (STOL ET AL.)**

Claims Requirements of the Present Invention	Stol et al. U.S. 6,769,595
Claim 1 recites “A method of tying two or more components together by means of a fastener, in which <u>each component is provided with a hole</u> ”	Stolet al. teaches that the benefit of the disclosed method is “eliminating the need for predrilled holes” (Col. 8, lines 49 – 51). Emphasis of this benefit appears in the reference in at least three other portions including Col.2, lines 6 – 27; Col. 2, line 65 and Col. 4, lines 23 – 24.
Claim 1 recites “- - - the <u>components are placed so that the holes overlap one another - -</u> ”	The reference teaches that the first and second components do not need to be predrilled with holes. Stol et al.’s process proceeds substantially without holes or overlap thereof.
Claim 1 further recites that the holes overlap“ - - to <u>receive the fastener in the holes - -</u> ”	Since Stol et al. teaches eliminating the need for predrilled holes, there is no description of pre-positioning of rivets in holes through the component parts.
The method of claim 1 is beneficial “- - - to <u>minimize the heat transfer from the fastener to the components being tied - -</u> ”	Stol et al. provides significant contrast with the present invention by requiring heat transfer between rivets and components being joined together. This need appears at least seven times including teachings at Col. 4, lines 32 – 48; Col. 6, lines 4 – 7; Col. 7, lines 38 – 54; Col. 7, lines 57 – 61; Col. 8, lines 40 – 44; Col. 8, lines 50 – 55 and Col. 9, lines 2 – 3 of the reference.

CLAIMS REJECTION UNDER 35 U.S.C. § 102:

The Office Action indicates rejection of claims 1, 3, 6, 7, 12, 15, 16 and 19 under 35 U.S.C. §102(e) due to anticipation by Stol et al. (USPN 6769595 B2). Referring to the statement of rejection, included below for convenience, the Examiner appears to overlook key requirements of claims of the present invention. Evidence of omissions will be provided following the statement from the Office Action as follows:

Stol teaches a method of tying components of an alloy with a rivet made of similar alloy (col. 2, lines 5 – 61) said alloys comprising Ti or Al (col. 2, lines 51 – 61) and intermetallic alloys (col. 9, lines 7 – 30). It is noted that the method is the same regardless of the alloy used. The rivet is placed in a pre-drilled hole and subjected to heat and pressure. Pre-heating is optional (col 7, lines 38 – 54 and col. 8, lines 1 – 48). A layer (clad) is arranged between components (col. 8, lines 1 – 10). The article which is an aircraft component comprises the alloys riveted together. It is noted that a similar article can be made by a variety of means including but not limited to welding, brazing and friction plug joining.

In rejecting claims 1, 3, 6, 7, 12, 15, 16 and 19, the Office Action appears to consider only the types of alloy involved in the formation of rivets and components to be tied together and the use of heat and pressure and optional preheating. The sentence, “The rivet is placed in a pre-drilled hole and subjected to heat and pressure.” is inaccurate and misleading, since Stol et al. places emphasis on the benefit of “eliminating the need for predrilled holes” (Col. 8, lines 49 – 51).

It has been shown in the summary table at the beginning of this section that Stol et al. fails to teach at least four requirements of claim 1 of the present invention, none of which appear in the statement of rejection. The four requirements of the present invention include the following:

1. The need for holes drilled in components to be tied together.
2. Overlap of the holes drilled in the components.
3. Placement of fasteners in the overlapping holes.
4. The need to minimize heat transfer from the fastener to the components.

With regard to the need for drilled holes, Stol et al. refers to the possibility of using holes at column 2, lines 24 – 27, but only after stating at column 2, lines 21 – 23, that such holes are not needed. The possible need for a pilot hole at column 8, line 29 clearly refers to a special situation involving multiple layers of components. That Stol et al. prefers joining components without pre-drilling holes, is evident from Col. 8, lines 49 – 51 and at least three other parts of the reference including Col. 2, lines 6 – 27; Col. 2, line 65 and Col. 4, lines 23 – 24.

Since Stol et al. recommends elimination of predrilled holes, it is essentially silent regarding points 2 and 3 above for alignment or overlap of holes and insertion of fasteners in the aligned holes.

The most significant contrast between the teachings of Stol et al. and the present invention is the opposing positions regarding heat transfer between the rivet or fastener and the components to be tied together. The process of claim 1 of the present invention requires minimum heat transfer, while the teachings of Stol et al. clearly indicate the need for significant heat transfer to soften or otherwise disrupt the structure of both the rivet and the components to cause metallic bond formation, i.e. a welded joint. Such bond formation is important to the method of Stol et al. that is described as force-plunge riveting (Col. 2, line 8) or friction plunge riveting (Col. 8, lines 53 - 55). Both terms refer to the method of friction welding taught by Stol et al. Discussion of the intention of Stol et al. to promote significant frictional heating to soften the rivet and first and second components occurs throughout the reference. Portions relevant to this purpose include Col. 4, lines 32 – 48; Col. 6, lines 4 – 7; Col. 7, lines 38 – 54; Col. 7, lines 57 – 61; Col. 8, lines 40 – 44; Col. 8, lines 50 – 55 and Col. 9, lines 2 – 3 of the reference.

Comparison of the teachings of Stol et al. and the present invention suggests that Stol et al. describes a process designed to limit crack nucleation etc. (Col. 8, lines 58 – 64). Limitation of heat transfer according to the present invention achieves a similar objective, but by a different method that Stol et al. fails to anticipate.

In light of the evidence applicants submit that Stol et al. fails to meet the teaching requirements of an anticipating reference under 35 U.S.C. §102. Rejection of claims “for want of novelty” requires that “each and every element” of the claimed invention must be found either expressly or inherently described in a single prior art reference. The evidence, discussed previously, shows that Stol et al. does not expressly or inherently describe at least four

requirements of claim 1 of the present invention. Applicants believe that claim 1 should be allowed. Claims 3, 6, 7, 12, and 19 have dependency from claim 1 and should likewise be allowed.

Claim 15 also requires the four limitations (see points 1 – 4 above) that are lacking in the teachings of Stol et al. For this reason, the reference fails to provide basis for rejection of claim 15, which applicants believe should be allowed. Claim 16 depends from claim 15 and should likewise be allowed.

In view of the above, applicants request reconsideration and withdrawal of the rejection of claims 1, 3, 6, 7, 12, 15, 16 and 19 under 35 U.S.C. §102(e).

REJECTION UNDER 35 U.S.C. § 103(a):

The Office Action includes rejection of claims 1 – 3, 6 – 10, 13, 15, 16 and 19 under 35 U.S.C. 103(a) as being unpatentable over Yoshida (JPN 10-205510 A) in view of Coletta et al. (USPN 6460750 B1). Attempting to respond to the apparent rejection for obviousness, applicants had difficulty determining exactly which reference provides teachings relied upon by the Examiner. Problems encountered are discussed briefly below, using the statement of rejection from the Office Action for convenient reference as follows:

Yoshida teaches a method of tying components of an alloy with a rivet made of a similar alloy (col. 2, lines 5 – 61) said alloys comprising Al (paragraphs 6 and 13). It is noted that the method is the same regardless of the alloy used. The rivet is placed in a pre-drilled hole (paragraphs 2 and 12) and subjected to heat and pressure (paragraph 5) via a combined pressure loading and heating tool (gun). The rivet is pressure loaded between electrodes of the tool. The fastener is heated by electrical current (abstract and paragraphs 10 – 14). Pre-heating is optional (col. 7, lines 38 – 54 and col. 8 lines 1 – 48). A layer (clad) is arranged between components (col. 8, lines 1 – 10). The article comprises the alloys riveted together. It is noted that a similar article can be made by a variety of means including but not limited to welding, brazing and friction plug joining. However, the rivet alloy is not further disclosed. Neither is an aircraft component disclosed.

The underlined portions of the previous paragraph cause confusion because the Examiner initially asserts that “Yoshida teaches components of an alloy with a rivet made of a similar alloy – –.” At the end of the paragraph admission that “the rivet alloy is not further disclosed“ is correctly stated in the case of Yoshida (emphasis added).

By review of the cited sections presented in bold typeface, it appears that the statement of rejection contains information from Yoshida, which is written in paragraph form, mixed with

information from Stol et al. that uses a columnar format. This would explain the conflict between the initial underlined statement and the later underlined statement.

For purposes of response, applicants have addressed teachings associated with paragraph citations as attributable to Yoshida and ignored statements identified by column and line designations.

The following summary table provides differences between the present invention and the teachings of Yoshida.

COMPARISON OF THE PRESENT INVENTION
WITH TEACHINGS OF THE REFERENCE (YOSHIDA.)

Claims Requirements of the Present Invention	Yoshida JPN 10-205510 A
The method of claim 1 is beneficial <u>“- - - to minimize the heat transfer from the fastener to the components being tied - -”</u>	The method of Yoshida overcomes the problems of deformation, curvature or distortion of the work piece that occurs with the use of a conventional riveting press (paragraphs [0003] and [0004]). Yoshida is silent concerning the need to minimize heat transfer from the rivet to work pieces.
Claim 1 further recites, <u>“both the fastener and the components made of the same or similar alloys, - - .”</u>	Yoshida teaches a riveting technique for use with aluminum, but is silent regarding the material of the rivet. While using the term “sheet metal,” the reference cites only aluminum (paragraph [0003]), which is not an alloy.

Evidence shows that Yoshida fails to teach at least two limitations of the process of claim 1 of the present invention, i.e. “to minimize heat transfer” and the requirement that the fastener and components are made of alloys of the same or similar type. It appears that a *prima facie* case of obviousness has not been established, as is required of the Examiner. *In re Deuel*, 51 F3d 1552, 1557, 34 USPQ 2d 1210, 1214 (Fed. Cir. 1995).

Omissions from the teachings of Yoshida of limitations recited in the process of claim 1 of the present invention leads to the condition that the combination of Yoshida and Coletta et al. is ineffective in support of a *prima facie* case of obviousness. Coletta et al. is also flawed in that the composition of the rivets does not appear to be the same or similar to the metal being friction welded.

The evidence, discussed previously, shows that Yoshida in view of Coletta et al. does not render the present invention as obvious. At least two requirements of claim 1 of the present invention are not found in the teachings of the references. Applicants believe that claim 1 should be allowed. Claims 2, 3, 6 - 10, 13, and 19 have dependency from claim 1 and should likewise be allowed.

Claim 15 also requires the limitations lacking in the teachings of Yoshida in view of Coletta et al. For this reason, the references fail to provide basis for rejection of claim 15 for obviousness. Applicants believe claim 15 should be allowed. Claim 16 depends from claim 15 and should likewise be allowed.

In view of the above, applicants requests the reconsideration and withdrawal of the rejection of claims 1 – 3, 6 – 10, 13, 15, 16 and 19 under 35 U.S.C. §103(a).

Claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Stol et al. (USPN 6769595 B2) in view of Rosman (USPN 3747466).

The reference of Stol et al. has been shown to lack suggestion or teaching of all the limitations of claim 15, from which claim 18 depends. Claim 15 is believed to be allowable and claim 18 should likewise be allowed. Therefore, Stol et al. in view of Rosman does not support a *prima facie* case of obviousness for rejecting claim 18.

Applicants request the reconsideration and withdrawal of the rejection of claim 18 under 35 USC §103(a).

ALLOWABLE SUBJECT MATTER

For reasons presented above, applicants believe that claims previously pending in the present application, i.e. claims 1 – 16, 18 and 19 are allowable over the references relied upon by the Examiner.

The indication of the allowability of the subject matter of claims 4, 5, 11 and 14 is acknowledged with appreciation.

CONCLUSION

The prior art made of record and not relied upon has been considered. Neither of the references of Litwinski (US 2003/0218052 A2) and Regie et al. (USPN 2957237) appears to be pertinent to the present invention as currently claimed.

Applicants have made an earnest attempt to respond to all the points included in the Office Action and request is respectfully made for reconsideration of the application and notification of allowance of claims 1 - 16 and 18 – 20 in the next paper from the Office.

The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application.

The undersigned representative authorizes the Commissioner to charge any additional fees under 37 C.F.R. 1.16 or 1.17 that may be required, or credit any overpayment, to Deposit Account No. 14-1437, referencing Attorney Docket No.: 7589.149.PCUS00.

In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner may directly contact the undersigned by phone to further the discussion.

Respectfully submitted,



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